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light of the forest, these verdureless plants elevate their brown and yellow stems, covered with scales instead of leaves, but having perfect flowers.

The *Monotropa*,—Indian pipe or Pine-sap,—more fungus-like still, holds a rightful place among the *Pyrolaceæ*, or Heaths, and with its clusters of white or tawny stems, each crowned with a large distinct flower, grows from the decayed roots and leaves of the oak and pine.

It has also been found that sundry leaf-bearing genera, situated at no great remove from the *Orobanchæ* are more or less parasitic upon the roots of other plants; and it is probably from this cause that the *Castilleja*, or painted cup, the *Gerardias*, and *Pedicularis* are so difficult, or so nearly impossible to cultivate. We have often transplanted them from their native wilds to the garden, and have as often met with disappointment. An English species of *Comandra*, similar to our *Thesium umbellatum*, whose fascicles of flowers remind one of diminutive bunches of white lilacs, is also said to form parasitic attachments upon the roots of trees.

OYSTER CULTURE.

BY F. W. FELLOWES.

BEYOND dispute or question, the French government has taken the lead of all the world in the scientific propagation and skilful culture of the oyster. For the past six years, the great discovery by the distinguished French savan, Professor Coste, of the mode of reproduction of this mollusk, has been converted to practical use; and in suitable localities on the western coast of France, imperial farms, or *parcs*, as they are called, have already

been put into successful operation. Many hundred million of these delicious bivalves (they are sold in France by the hundred, or count, and not by the bushel as with us) now flourish and fatten in shallow bays and basins, where, a few years since, not a solitary specimen could be taken, owing to the thoughtless and improvident industry of the fishermen, who captured and sold every oyster they could find, regardless of season, size, or condition. As a natural consequence the native growth was exterminated, and it seemed probable that a source of profitable labor was gone forever from a very considerable number of the fishing class on the seaboard, who, in overpopulated France, could ill afford to lose one chance of earning their few sous a day; while, on the other hand, the tables of the rich were likely to be deprived of one of their favorite and most esteemed luxuries.

Just at this time, in 1858-9, Professor Coste settled a long-mooted point in natural history, namely, that the oyster—in common with many of the lower order of acephalous animals—is hermaphrodite, combining both sexes in the same individual, and his theory of its generation is substantially as follows:—

Possibly the second year, but certainly the third year, the oyster reproduces its kind. During the summer, at seasons varying with locality and temperature from April to July, many hundred thousand ova are simultaneously produced in *capsules* provided for them; these ova are fecundated at an early period of their growth, long before their increase of size and weight causes them to burst the ovarian capsules, and commence their existence in the milky fluid which is prepared for them at this time. The ova are especially enveloped and protected by the branchial folds of the

mother oyster. By an admirable provision of nature, this milky fluid now begins to dry up and thicken, forming a paste which deposits upon the ova exactly what is necessary to form a delicate shell in a few hours, when brought into contact with the salt water by expulsion from the shell of the parent oyster. No sooner is one brood thus sent out into the world of waters to shift for itself, than this process is immediately repeated, and it is known that an adult oyster produces between two and three million of young during a season.

Although the oyster is so remarkably prolific, the "spat" or "spawn" has so many enemies who feast upon it, and there are so many chances against its safely finishing the second year,—when it is tolerably safe,—that an average of less than one-tenth is permitted to attain a merchantable size.

The spawn does not escape of its own accord from the mother oyster, but is expelled (*lancé*) with considerable force, forming at first a grayish cloud which soon disperses and disappears by motion of the water and by individual action, as each young oyster—gifted with slight filial affection—seems eager to remove as far as possible from its parent and the place of its birth, and fearlessly swims away, henceforward to take care of itself and find its own means of existence. These independent little ones are provided with a special locomotive apparatus,—which is at the same time an organ of respiration, and perhaps of hearing and of vision,—by means of which they disperse themselves at the proper time in search of some hard and solid body like a stone, a branch, or a shell to which they can attach themselves and "settle down" for life.

"Nothing is more curious and more interesting," says

M. Davaine in his "*Recherches sur la génération des huîtres*," than to see, under the microscope, these little mollusks travel round the portion of a drop of water, which contains them in vast numbers, mutually avoiding one another, crossing each other's track in every direction with a wonderful rapidity, never touching and never meeting."

This curious motive power consists of a great number of hair-like filaments, called *cilia*, which take their rise in a dark-colored fleshy mass that emerges from, and overlaps the valves of the oyster on the edge opposite to, and farthest from the hinge, and operated by powerful muscles, can be at pleasure drawn entirely within the valves.

If the young wanderer meets with any hard substance, it clings to it, and in a few hours—as it is at this time rapidly making its shell—a calcareous deposit fixes it there, and, in due course of time, the cilia drop off. But even if no such suitable object presents itself, these wanderings must certainly soon come to an end.

The base of the locomotive apparatus gradually narrows, this organ becomes more and more prominent, until it is only attached by a single slender membrane to the oyster,—which still continues to travel with it,—when, at last, it entirely detaches itself from the oyster, which at once sinks, incapable of farther motion, while the cilia keep on swimming; but, like a vessel without a helm or pilot, their motion is undirected, they roll over and over on themselves, colliding with everything in their course, and, though they can hardly be said to die, soon cease to move.

As soon as the cilia are removed, the oyster commences life in earnest: lips to seize its food, and a stomach to digest it, are developed; *branchiæ*, or respiratory

organs appear ; the heart reveals itself and begins to beat ; all the functions necessary for existence are set in motion in good working order ; and if fortunately placed for obtaining infusorial and vegetable nourishment, in three or four years this embryo "Cove" or "Millpond" or "Shrewsbury" will become a delicate mouthful for the consumer.

Though there are many other enemies of the modest and inoffensive oyster, there are three which are specially feared, and cause the greatest loss to the planter in American waters, namely, the "Starfish" (*Asterias arenicola* Stimpson), the "Drill" (*Buccinum plicosum* Gould), and the "Winkles" (*Pyrula canaliculata* and *P. carica*).

All are familiar with the appearance of the Starfish, though few, even of old oystermen accustomed to annual losses from this five-fingered pest, are acquainted with the manner in which it is so destructive. Even writers upon the oyster, whose general information upon this subject should have taught them better, have fallen into the same error of supposing that the taper fingers are introduced between the valves, and, in some mysterious manner, kill and devour the contents.

The Starfish is provided with an extensible mouth, situated in the middle of the underside, and can only injure an oyster of a certain size relative to its own. If the oyster is small enough, it is swallowed shell and all ; the body is digested, and the shell ejected. But if its victim is a little too large for this operation, Nature has provided this scourge with the power to turn its stomach inside out, envelope the unhappy oyster, and absorb the dainty flesh within by means of gastric juice. A. Agassiz, in "Seaside Studies," speaks of this peculiarity as follows : "These animals have a singular mode of eating ; they

place themselves over whatever they mean to feed upon, as a cockle-shell, for instance, the back gradually rising as they arch themselves above it; they then turn the digestive sac, or stomach, inside out, so as to enclose their prey completely, and proceed leisurely to suck out the animal from its shell."

When nothing more within the shell remains to be eaten, the stomach is turned back again, and, gifted with a constant and insatiable appetite, the Starfish is ready to recommence its filthy feeding upon the first oyster within its reach. The countless suckers on the underside of this animal are used only for locomotion, just as the fly walks upon the ceiling by means of a similar contrivance on the feet. The general belief that the Starfish takes its nourishment in some mysterious way by means of these suckers is consequently an erroneous one, as they have no openings at the ends, and do not connect in any way with the stomach.

The Drill is a troublesome and destructive intruder upon the oyster-bed, the more so that, from its small size and rapid multiplication, it is difficult to eradicate from a locality when it has once colonized in force. Whole beds are sometimes taken up and transplanted, to avoid this detestable little thief. A slightly different species of the Drill forms no small item of cheap food for the French peasants. They call it the Bigorneau (*Murex tarentinus*), and, when boiled, the meat is picked out with a large needle. Its flavor is excellent, though it is repulsive in appearance, being of a dark green color, and having a decided spiral tail, which renders it anything but inviting to a person about to eat it for the first time.

The Drill has a dark, ridgy, conical shell, about an inch long, and by the help of a broad, flat, fleshy foot, with

which it is provided, fixes itself exactly over what is commonly called the eye of the oyster, and by means of a rough file-like tongue, which it moves forward and back, over the chosen spot, soon drills a round hole through the shell, and sucks out the life and juices of the oyster at its leisure.

The Winkles are a much larger species of the same tribe, and destroy the oyster in a similar manner, only not being so numerous, they cause less damage, and are not so much dreaded by the oyster planter as the little Drill.

The oysters to be found on the *carte* of any good restaurant in Paris are,—the common oyster, price fifteen cents per dozen; the Ostend, price thirty-five cents per dozen; the Marennes, or green, price thirty-five cents per dozen; and the Imperial, price forty cents per dozen.

Each variety has a peculiarity, and its special admirers. The last three, during the winter months, are fat and full-flavored, though small; the Ostend and Imperial being English born, but cultivated and manipulated in France. The French oyster-shell is more round and flat than our own, the body lying in a sudden deep depression close up to the hinge, while a considerable space of the interior of the shell is unoccupied by anything except the mantle. A dozen of either of the last three varieties is a better appetizer to commence a dinner with, than any kind known in this country; while for cooking in every form, the much larger size of the American oyster renders it by far superior.

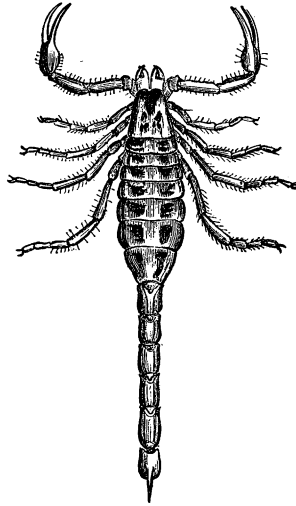
The French lay great stress upon having the shell of this oyster extremely clean (*bien nettoyé*). A gentleman at Marennes, who cultivates the green oyster, has recently erected a tide-mill—for which he has a patent—for the

double purpose of smoothing the roughness and perfectly cleansing the outside, and of wearing off enough weight of shell by *trituration* to save a dollar freight on the railway carriage to Paris, of a *panier* containing a thousand.

SCORPION OF TEXAS.

BY G. LINCUM, M. D.

THE scorpions of Middle Texas, so far as I have investigated the subject, do not extend beyond a single species. There may be others, but I have not observed them. The species we have is viviparous, carrying its young, eight in number, on its back, until they are three-fourths of an inch in length. When first seen, clinging on the back of the mother scorpion, they are so small that it requires a microscope to examine them satisfactorily. They are white, and look as if they were very tender. They cling tenaciously, and when by violence they are separated from the mother, she shows manifest signs of distress, running about till she comes in contact with the lost ones, when they immediately climb up and cling again closer than before. At this early period, they seem already to be well versed in scorpion tactics, wielding their nimble tail, and its recurved weapon, with dexterity and swiftness.



Scorpions pass the winter in close quarters, and gen-